

PREFACE

Beyond Horizons: A Half Century of Air Force Space Leadership is a study of the United States Air Force in space. Of all the military services, the Air Force has been preeminently involved for the past fifty years in initiating, developing, and applying the technology of space-based systems in support of the nation's national security. Yet there has been no single-volume overview of the Air Force space story to serve as an introduction and guide for interested readers. In November 1992, a high-level Air Force Blue Ribbon Panel on Space, chaired by then Lieutenant General Thomas S. Moorman, Jr., commander of Air Force Space Command, concluded there was a specific need to better educate people, both in the service and among the general populace, about the history of Air Force space activities. *Beyond Horizons* has been written to meet this need.

Beyond Horizons begins with a review of pre-World War II rocketry developments and the forging of the important partnership between the Army Air Forces' Brigadier General Henry H. "Hap" Arnold and noted Cal Tech aerodynamicist Theodore von Kármán. Wartime provided important momentum in establishing the foundation for later Air Force space efforts. At Arnold's initiative, von Kármán, late in the war, formed what became the United States Air Force Scientific Advisory Board and produced *Where We Stand*. This seminal study provided the Air Force a research and development agenda for the future. Equally important, the Air Force-sponsored Rand Corporation, in early 1946, issued a report on the feasibility of artificial satellites that would lead to the important Project Feedback reports of the

early 1950s. Although the von Kármán and Rand studies produced no immediate rush to develop space systems, the ground had been prepared.

Chapter 1 focuses on space and missile efforts prior to the launch of the Soviet Sputnik satellites in late 1957. Beginning with analysis of the Rand satellite report, the chapter examines the policy, organizational, and funding constraints, based largely on inter- and intra-service rivalries, that Air Force missile and space advocates had to overcome during the late 1940s and early 1950s in order to establish an effective enterprise. In a sense, the Air Force entered the space age on the coattails of intercontinental ballistic missile (ICBM) development and President Dwight D. Eisenhower's determination to protect the nation from surprise attack. Operational ballistic missiles could also serve as satellite boosters, while a reconnaissance satellite could provide strategic intelligence on Soviet capabilities. Along with the other services, the Air Force pursued missile and satellite development by establishing the Western Development Division and giving its commander, Brigadier General Bernard A. Schriever, wide-ranging responsibilities to produce an operational ICBM and a military reconnaissance satellite. Eventually, these efforts would lead to the Lockheed Agena booster-satellite, the infrared missile warning satellite, and the reconnaissance satellites of the National Reconnaissance Office.

Chapter 2 focuses on the important policy and organizational steps taken after Sputnik which helped the Air Force achieve leadership of the nation's military space activities. Initial Air Force hopes of leading a national space program ended with the establishment of the National Aeronautics and Space Administration (NASA). At the same time, NASA's absorption of Army and Navy space assets left the Air Force pre-eminent in military space and the new civilian agency dependent on the service for the immediate future. During the second Eisenhower administration, the Air Force initiated the first of several unsuccessful "campaigns" to receive formal recognition as executive agent for all military space efforts with approval to lead an expanded space program. Forced to share space responsibilities with the other services and agencies, Air Force leaders also chafed under an Eisenhower space policy that downplayed military space activities and prohibited deployment of weapons in space.

Chapter 3 describes Air Force efforts to achieve a dominant role in space through its support of NASA and its attempts to acquire a military manned spaceflight mission and approval for development of space-based weapons. Expectations were high at the outset of the Kennedy administration when Defense Secretary Robert McNamara designated the Air Force the military service responsible for space research and development, and the service established Air Force Systems Command to lead the way. Yet, by the end of the 1960s, NASA basked in the glow of its lunar landing, while cancellation of the Air Force's Manned Orbiting Laboratory ended hopes for a military manned space mission. Moreover, earlier it had become clear that space policy would continue to restrict space-based weapons to the study phase. Despite the seemingly bleak outlook for an Air Force space future by the

early 1970s, however, two developments would reinvigorate the Air Force space program—the success of instrumented satellites and the Space Shuttle.

Chapter 4 examines the Air Force's leadership role in the emergence of artificial earth satellites during the 1960s for communications, navigation, meteorology, and surveillance and reconnaissance. These mission functions had been identified in the late 1950s and would remain the bedrock of space activities for the remainder of the century. Booster and infrastructure support paralleled the rise of unmanned satellites. The Air Force developed more powerful launch vehicles and established worldwide networks for ground-based control of satellites, space surveillance, and missile warning. By the end of the decade, unmanned military spacecraft had demonstrated important operational applications including, during the Vietnam conflict, the first use of satellites to support military requirements in wartime.

Chapter 5 discusses the complex interplay of space policy, organizational, and operational issues that culminated in the formation of the Air Force's Space Command. The maturing of unmanned satellites and the advent of the Space Shuttle compelled the service to confront and reassess its fragmented organization for space and the heretofore dominant role of the space research and development community. With the increasing importance of space for operational commanders, the central questions became whether the research and development commands should continue to launch spacecraft and provide on-orbit control, and whether the service should create an operational command for its space activities. The debate led to the establishment of a major command for space operations in September 1982.

Chapter 6 describes the efforts of Air Force Space Command in the 1980s to consolidate its control over space systems and move the Air force from an "operational agenda" for space to the creation of an "operational mindset" for space. Along the way the command had to achieve an effective working relationship with a new unified United States Space Command and deal with the space launch crisis resulting from the *Challenger* disaster. By the end of the decade Air Force leaders increasingly referred to the "operationalization" of space in making space systems critical to the warfighter.

Chapter 7 focuses on the role of space in the Persian Gulf War in early 1991. This conflict represented the coming of age of military space by demonstrating the value of an "operational mindset" for space. During Desert Storm, space systems that traditionally had supported strategic requirements proved sufficiently flexible to provide essential tactical support to the warfighter.

The final chapter serves as both a summary of the Air force space story and a point of departure for assessing Air Force space prospects for the new century. The Gulf War provided the momentum for the Air Force to take advantage of the further technological growth and refinement of military space systems and the emerging trends toward greater military use of civil and commercial space capabilities in order to better institutionalize space within the Air Force. The study concludes with

an assessment of the Air Force's leadership position in the ongoing debate over service roles and missions and its vision for the nation's space program as the United States prepared to enter the 21st century.

In preparing this study I received help from many quarters. Above all, I wish to thank the historians at Air Force Space Command—Director of History Mr. George W. “Skip” Bradley, and Dr. Rick W. Sturdevant and Dr. Rick Eckert. All three read the entire manuscript and provided wise counsel and unstinting encouragement. Skip Bradley directed the project with a firm hand and provided full access to the wealth of information in the command's historical archives. Rick Sturdevant tracked down many documents and labored mightily to have classified material downgraded and made available for my use. The knowledge he shared through many hours of discussion contributed substantially to my understanding of key policy and technical issues. Of special note, early in the project we elected to defer more complete coverage of the Air Force-National Reconnaissance Office relationship until a larger portion of the historical record is accessible. Rick Eckert offered important suggestions from his perspective as the primary author of the space chapters in the command's periodic histories. He also performed the final editing of the manuscript as well as completed the design and page layout in preparation for printing. I also wish to acknowledge the outstanding administrative support provided by Ms. Karen Martin of the command's Office of History.

I am especially indebted to three historians who agreed to read and comment on the initial draft for accuracy and clarity. Mr. R. Cargill Hall, the person responsible for contract histories at the Center for Air Force History, offered many insights based on his extensive knowledge and long experience in the civilian and military space communities. NASA historian Dr. Roger Launius provided valuable suggestions on the portions of the study dealing with early rocket developments and issues affecting NASA. I also greatly benefited from the comments of Dr. Donald R. Baucom, Ballistic Missile Defense Organization historian, whose understanding of missile defense and the Strategic Defense Initiative is second to none. They, of course, are not responsible for my interpretation of the Air Force space story.

Individuals at two major military archives also deserve special thanks. Dr. Timothy C. Hanley and Dr. Harry N. Waldron, III of the Space and Missile Systems Center at Los Angeles Air Force Base, California, generously allowed me extensive use of their important document collection that begins with records of the Western Development Division in the early 1950s. Colonel Richard S. Rauschkolb, commander of the Air Force Historical Research Agency at Maxwell Air Force Base, Alabama, also went beyond the call of duty to support my research efforts. As a result, I benefited from the knowledge and helpfulness of the agency's outstanding group of archivists and historians. I also wish to acknowledge Dr. Thomas Fuller, United States Space Command historian who furnished useful documents on

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contemporary space issues as well as his perspective on issues affecting the unified command. Additionally, I am grateful to Lee D. Saegesser, NASA Headquarters History Office archivist, who provided sound advice and access to his substantial holdings on Air Force-NASA issues.

Special thanks are owed to two individuals central to the Air Force story. General Bernard A. Schriever, the “father” of the Air Force space program, gave me the benefit of his views on the early years, and former Air Force Secretary and Director of the National Reconnaissance Office John L. McLucas helped broaden my understanding of space programs and issues during the 1960s and 1970s.

Finally, it should be recognized that a book of this nature could not have been completed without the benefit of the work done by the Air Force space pioneers and the historians who documented and recorded the Air Force story. We who are their heirs are forever in their debt.

David N. Spires
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